**Amendments to the Drawings:**

The attached sheet of drawings includes changes to Figures 3a-3b. An annotated page showing the changes made to Figures 3a-3b is also provided. Formal drawings are submitted herewith under separate Letter to the Draftsperson which incorporate the changes required by the Examiner. For the convenience of the Examiner, a copy of the formal drawings are also attached with this amendment. Approval by the Examiner is respectfully requested.

Attachment: Replacement Figures 1-5
Annotated Figs. 3a-3b showing the legend "prior art."

## REMARKS

**Status of the Claims:**

The Office Action dated November 15, 2005 has been received and reviewed by the applicant. Claims 1 is amended and claims 21-30 are new. Claims 1-7 stand rejected.

**Drawings:**

Figures 3a-3b should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. Corrected drawings in compliance with 37 CFR 1.121(d) are attached.

**Claim Rejection - 35 USC § 102**

Claims 1, 3-7 stand rejected under 35 U.S.C. 102(b) as being anticipated by Mita - US 5,252,851.

Claims 1, 3-7 stand rejected under 35 U.S.C. 102(b) as being anticipated by Mita - EP 0576009.

Claims 1, 3-7 stand rejected under 35 U.S.C. 102(e) as being anticipated by Zhao - US 6,586,789.

**Claim Rejection - 35 USC § 103**

Claim 2 stands rejected under 35 U.S.C. 103(a) as being unpatentable over (Mita - (either one) or Zhao) and applicant's admitted prior art.

**Claims Patentable Over Cited Art**

All of the claims are patentable over the prior art in view of the above amendment. The invention defines the method that provides a depletion region under the first well. This method is not shown or suggested in the cited art.

Claim 1 and its dependent claims are patentable over Mita (US 5252851) because the reference precludes forming a depletion region under the first or P+ well. In Mita the well P+ well 33 merges with the precursor diffusions 31 to form a continuous, U-shaped P+ well. As such, the amount of the depletion in the epitaxial layer 16 is limited by the merged regions 33. 31 (15). In contrast, the invention does not merge surface and substrate P+ regions and thus allows the

depletion region to spread laterally in the epitaxial layer beneath the floor of the first well.

Claims 22-30 are patentable over Mita (US 5252851) for the same reasons as claim 1.

The claims are patentable over Mita EP 0576009. That reference has the same drawbacks as Mita US 5252851. The vertical P+ regions in separating columns 26 limit the lateral range of depletion in the epitaxial layer.

Claim 1-7 and 21are patentable over Zhao US 6586789 because Zhao does not permit the depletion zone to extend beyond the vertical P regions. Zhao is a lateral diode and must contain the depletion region. That reference shows p-type separating columns 103, 109 that limit the lateral extent of depletion in the epitaxial layer. Zhao is quite specific about this limitation:

> FIG. 5 illustrates an electric field in a pixel image sensor in an accumulation operation according to one embodiment of the present invention. When the lateral photodiode element is reverse-biased as illustrated in FIG. 5, depletion region 211 has an electric field that forces the electrons generated from photoelectric conversion to move toward N-type region 203 (e.g., as shown laterally in direction 221). Under the influence of the potential level of the enclosing P-type regions 205 and 207, a low voltage region (e.g., near potential line 213) is formed in the P-epi layer between N-type region 203 and substrate 201. The low voltage region serves as a potential barrier, which prevents the electrons collected in region 203 from moving toward substrate 201. Col.5, lines 25-37

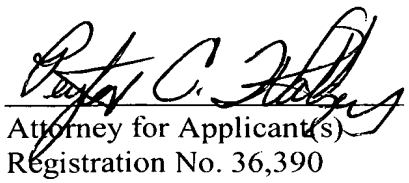
Claims 21-30 define a vertical diode with a heavily doped layer of first polarity type in the substrate. Zhao is a lateral diode and does not have the heavily doped substrate layer of a polarity the same as the first well.

**Summary**

Should the Examiner consider that additional amendments are necessary to place the application in condition for allowance, the favor is requested of a telephone call to the undersigned counsel for the purpose of discussing such amendments.

For the reasons set forth above, it is believed that the application is in condition for allowance. Accordingly, reconsideration and favorable action are respectfully solicited.

Respectfully submitted,



Attorney for Applicant(s)
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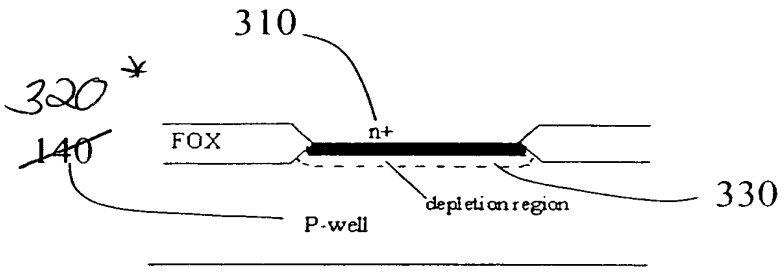
Facsimile: 585-477-4646

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.




* Changed to correctly reflect the specification

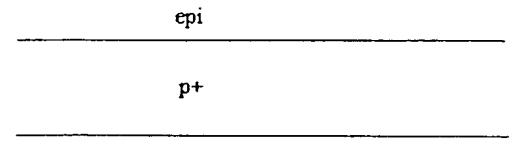



Fig. 3a (Prior Art) ← added per the Examiners Request

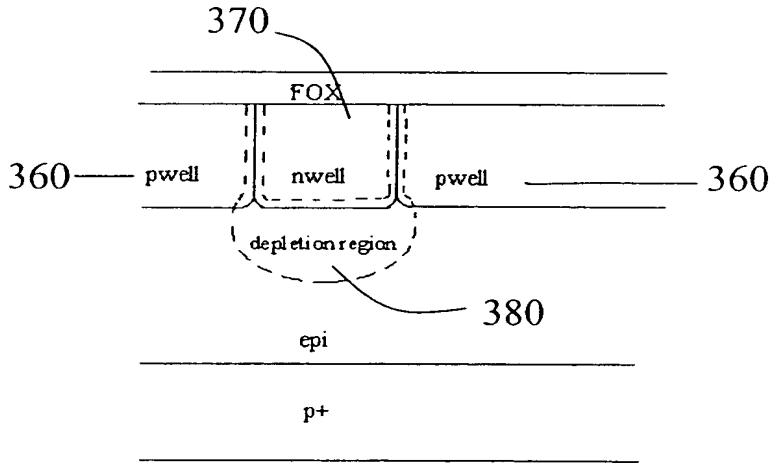



Fig. 3b (Prior Art) * added per the examiners request

INFORMAL DRAFT